Muhammad Tahir **Ashraf**

Ph.D. Chemical Engineering · Process Engineer · Data Scientist

Department of Chemical Engineering, Masdar Institute, Part of Khalifa University of Science and Technology, Masdar City, PO Box 54224, Abu Dhabi, UAE

(+92) 332-438-4303 | tahircpe@gmail.com | tahircpe

Experience

Masdar Institute *Abu Dhabi, UAE*

Ph.D. Research *Jan. 2014 – Dec. 2017*

- Worked with a multidisciplinary team from Masdar and & MIT to assess biorefinery feasibility in an arid under the collaborative project:"Biorefinery: Integrated Sustainable Processes for Biomass Conversion to Biomaterial, Biofuels and Fertilizer".
- Proposed and evaluated use of multi-feedstock lingocellulose for envisioning a biorefinery in arid regions like the UAE, results are published in *Bioresource Technology*.
- Carried out process simulation and techno-economic assessment of multi-feedstock pretreatment for the prospective biorefinery, results are published in *Bioresource Technology*.
- Developed process simulation and economic assessment models for various sections of the biorefinery process using Aspen Plus®, SuperPro® Designer, and MATLAB®

Massachusetts Institute of Technology (MIT) *Boston, USA*

Advanved Study Program & Research *Sep. 2015 – Jan. 2016*

- Developed and implemented a mathematical framework to optimize the biorefinery network, results are published in *Comput. Aided Chem. Eng*.

Freelance at Upwork *Online*

Process Engineer & Data Scientist *Aug. 2013 – Present*

- 100% job success rate after working with 14 clients and for 1100+ hours.
- Developed design and rating tools natural gas grid heating application while working as lead process engineer for ProHeat Systems Ltd.
- Technology consultant for the Inventix Inc. USA, for the municipal solid waste to power project.

American University of Sharjah (AUS) *Sharjah, UAE*

M.Sc. Research & Graduate Teaching Assistant *Sep. 2011 – Jul. 2013*

- Design and optimized p-xylene production from toluene, results are published in *I&ECR*.
- Optimization of refrigeration cycle for the liquified natural gas (LNG), results are published in *Energy Technology.*
- Conducted tutorials and labs training for the undergraduate students while working part time as graduate teaching assistant in the Department of Chemical Engineering, AUS.

Lotte Chemicals Pakistan Ltd. *Karachi, Pakistan*

Process Engineer *Aug. 2010 – Sep. 2011*

- Process data analysis on daily plant data to gain insight on performance and help in case of troubleshooting.
- Developed key performance indicator (KPI's) dashboard using wrangling, statistical analysis, and visualization of the plant historian data.

Education

Masdar Institute *Abu Dhabi, UAE*

Ph.D. Chemical Engineering — GPA 3.67/4.0 *Jan. 2014 – Dec. 2017*

- Research focused on biorefinery process design, process optimization, experiment design, and biomass characterization.
- **Dissertation title:** Valorization of Mixed Lignocellulosic Residues in the UAE using a Biorefinery Concept.
- Select courses: Bioprocess Modeling, Biorefinery Processes and Products, Data Sampling and Analysis

American University of Sharjah *Sharjah, UAE*

M.Sc. Chemical Engineering — GPA 3.67/4.0 *Sep. 2011 – Jul. 2013*

- Research focused on Chemical Process Design, Process Simulation, and Process Optimization.
- Select courses: Kinetics and Reactor Design, ChE Thermodynamics, Natural Gas Processes Optimization, Catalysis.

University of Engineering and Technology Lahore *Lahore, Pakistan*

B.Sc. Chemical Engineering — GPA 3.48/4.0 *Sep. 2006 – Jul. 2010*

Awards & Scholarship

2017	**JupyterCon Student Scholarship**, NumFOCUS & O'Reilly Media	*NY, U.S.A*
2015	**Advanced Study Program at MIT**, Masdar Institute & MIT Exchange Program	*Boston, U.S.A*
2014	**PhD Award**, Masdar Institute	*Abu Dhabi, U.A.E*
2011	**Graduate Teaching Assistantship Award**, American University of Sharjah	*Sharjah, U.A.E*

Expertise

Strengths	Process Design, Optimization, Techno-Economic Assessment, Statistical Data Analysis, Data Visualization
Software	MATLAB®, Python, Aspen Plus®, Aspen HYSYS®, SuperPro Designer®
Certification	Python for Data Science and Machine Learning — Udemy
Languages	English, Urdu, Punjabi

Interest

Sports\Fitness	Cricket fanatic (Captain of University Team), Badminton, Squash, Running, Gym (irregular)
Leisure	Fiction (this year favorite — Exit West by Mohsin Hamid), Dine out, Cinema

Publications

Journal Articles

1. **Ashraf, M. T.**, Schmidt, J. E., **2018**, Process Simulation and Economic Assessment of Hydrothermal Pretreatment and Enzymatic Hydrolysis of Multi-feedstock Lignocellulose — Separate vs Combined Processing, Bioresour. Technol., 249, 835–843.
2. **Ashraf, M. T.**, Thomsen, M. H., Schmidt, J. E., **2017**, Hydrothermal Pretreatment and Enzymatic Hydrolysis of Mixed Green and Woody Lignocellulosics from Arid regions, Bioresour. Technol., 238, 369-378.
3. **Ashraf, M. T.**, Schmidt, J. E., Kujawa, J., Kujawski, W. & Arafat, H. A., **2017**, One-dimensional Modeling of Pervaporation Systems using a Semi-empirical Flux Model. Sep. Purif. Technol. 174, 502–512.
4. **Ashraf, M. T.** et al., **2016**, Estimation of Bioenergy Potential for Local Biomass in the United Arab Emirates. Emirates J. Food Agric. 28, 99–106.
5. **Ashraf, M. T.**, Chebbi, R. & Darwish, N. A., **2013**, Process of p-Xylene Production by Highly Selective Methylation of Toluene. Ind. Eng. Chem. Res. 52, 13730–13737.
6. Chebbi, R., Qasim, M., Darwish, N. A. & **Ashraf, M. T.**, **2013** Optimization and Cost-Oriented Comparison of Ammonia- and Propane-Compression Refrigeration for the Recovery of Natural Gas Liquids. Energy Technol. 1, 573–580.

Book Chapter

1. Torres, A.I., **Ashraf, M. T.**, Chaturvedi, T., Schmidt J. E., Stephanopoulos, G., Hydrothermal Pretreatment: Process Modeling and Economic Assessment within the Framework of Biorefinery Processes. In: Ruiz HA, Thomsen MH, Trajano HL, editors. Hydrothermal Processing in Biorefineries. Springer; 2017.

Conference Proceedings

1. **Ashraf, M. T.** et al., **2016**, Optimization of Lignocellulosic Waste Biorefinery using Multi-Actor Multi-Objective Mathematical Framework. in 26th European Symposium on Computer Aided Process Engineering (eds. Kravanja, Z. & Bogataj, M.) 1317–1322.
2. **Ashraf, M. T.**, Bastidas-Oyanedel, J.-R. & Schmidt, J. E., **2015**, Conversion Efficiency of Biogas to Liquids Fuels through Fischer-Tropsch Process. in 23rd European Biomass Conference and Exhibition 23, 1008–1015.
3. **Ashraf, M. T.**, Al-Boainain, S., Belasri, D. & Schmidt, J. E., **2014**, Biogas potential of Bermuda grass and Clerodendrum inerme from the Emirate of Abu Dhabi. in XI Latin American Symposium of Anaerobic Digestion 403–410.
4. Bochenski, T., Torres, A. I., **Ashraf, M. T.**, Schmidt, J. E. & Stephanopoulos, G., **2016** Evaluation of the production of lipids for fuels and proteins from microalgae by decomposition of the processing network. in Proceedings of the 26th European Symposium on Computer Aided Process Engineering – ESCAPE 26 (eds. Kravanja, Z. & Bogataj, M.) 1635–1640.